

REMARKS

The rejections of Claims 1-8, 10-13, 18-22, 36 and 37 under 35 U.S.C. §102(b) as clearly anticipated by, and of Claim 9 under 35 U.S.C. §103(a) as unpatentable over, the Science and the Glass Industry article of Koz'min et al, is respectfully traversed. Koz'min et al neither disclose nor otherwise suggest the claimed subject matter of present Claim 38, since Koz'min et al do not disclose the addition of combustible elements with or within the vitrifiable materials feeding the melting chamber. Koz'min et al also do not suggest that it is possible to add a combustible element in the mass of the starting materials, in addition to or in replacement of the combustible feeding directly the submerged burner, like hydrogen, methane and light gaseous hydrocarbon compounds. The choice made according to Claim 38 is very advantageous for the whole glass industry. It makes it possible to feed the melting furnace with at least partly organic materials and glass/organic composite materials that were hard to recycle (like windshields or mineral wool with organic binder). This is possible only because the burners are submerged ones. Only those particular burners make it possible to bring the combustibles at their vicinity, below the bath of molten glass. Furthermore, as explained in the specification, the submerged burners generate a lot of convection movements within the bath of molten glass, which makes the permanent renewal of the combustible elements at their vicinity possible. This is very innovating and could not have been imagined with conventional melting furnaces (either those using immersed electrodes and called electrical furnaces or those using burners above the bath of molten glass and sometimes called gas furnaces). This is a completely new use of the technology of the submerged burners (recycling/valorization of composite/waste materials), which renders it more attractive.

The subject matter of new Claim 57 is also new and inventive for the same reasons.

For all of the above reasons, it is respectfully requested that the rejection over Koz'min et al be withdrawn.

The rejections under 35 U.S.C. §103(a) of Claims 14-16, 23, 24, 26 and 29 over Koz'min et al in view of U.S. 3,938,981 (St. John); of Claim 17 and 31 over Koz'min et al in view of U.S. 3,260,587 (Dolf et al); and of Claims 32-35 over Koz'min et al in view of U.S. 5,567,218 (Ladirat et al), are respectfully traversed. St. John has been relied on for a disclosure of refining molten glass. Dolf et al is relied on for a disclosure of submerged combustion methods and apparatus. Ladirat et al is relied on for a disclosure of a melting chamber with water-cooled walls or molybdenum-lined refractory.

St. John does not remedy the above-discussed deficiencies in Koz'min et al with regard to their melting method, because St. John deals exclusively with a refining step. Note with regard to Claim 95, which recites a refining step, Koz'min et al disclose a refining compartment connected to a melting compartment (Figure 1, page 624). St. John also concerns a refining compartment clearly separated from the melting compartment.

Claims 95-97 are separately patentable. None of the applied prior art suggests operating the refining step within the melting furnace, as illustrated in Figure 4 of the specification. This is clearly advantageous, because the industrial tool for melting and refining the glass is smaller, the glass is more quickly molten and refined, and the output yield is better. It was far from obvious to dare to operate both the melting and the refining steps in the same compartment. This has been made possible because of the specificity of the glass that is molten with submerged burners. This kind of glass is in fact very foamy, with

large bubbles that are easier to eliminate during the refining step than small ones, especially when the glass is in "thin layer".

The subject matter of Claim 73 is also patentable in view of the applied prior art. None of the references discloses such a structure for the walls of the melting chamber. This is quite important when it is equipped with submerged burners. The strong convective movements within the glass bath are not good for the durability of the walls of the melting chamber, as explained in the specification. The use of walls combined with a cooling system so as to create a "colder", more quiet, zone near the walls and/or the metallic walls make it possible to use fully those very particular burners, without detrimental consequences on the longevity of the melting furnace itself.

For all of the above reasons, it is respectfully requested that these rejections be withdrawn.

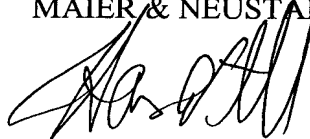
The rejection of Claims 1-37 under 35 U.S.C. §112, second paragraph, is respectfully traversed. Indeed, the rejections are now moot except for the rejection stated at paragraph 10 of the Office Action. This rejection is traversed in view of the disclosure in the paragraph bridging pages 14 and 15 regarding the meaning of the ratio $R1/R0$ (erroneously listed as $R1$ and $R2$ by the Examiner). Since an Applicant is entitled to be his own lexicographer, one skilled in the art would understand the meaning of this term. See In re Hill, 73 USPQ 482 (CCPA 1947) and MPEP 2111.01. Accordingly, it is respectfully requested that this rejection be withdrawn.

The objection to Claims 17 and 18 are now moot in view of the above-discussed amendment. Accordingly, it is respectfully requested that it be withdrawn.

Applicants gratefully acknowledge the Examiner's indication of allowability of the subject matter of Claims 25, 27, 28 and 30. Nevertheless, Applicants respectfully submit that all of the presently-pending claims in this application are now in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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IN THE CLAIMS

Claims 1-37 (cancelled)

Claims 38-99 (new)